PRE-REHABILITATION PLAN
PILLAR-WIDGEON AND HAMPTON LAKE CHAINS
Grant County, Washington

Photo Credit: Michael Schmuck, WDFW

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Fish Program/Management Division/Region 2
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I. PROPOSAL

i. Background:

The Pillar-Widgeon and Hampton Lake Chains is a series of connected waters located within the Columbia National Wildlife Refuge (CNWR) just south of Potholes Reservoirs in Grant County. The Pillar-Widgeon Lake Chain consists of 10 waters of varying sizes that includes Pillar, Snipe, Cattail, Gadwall, Poacher, Lemna, Shoveler, Sago, Hourglass, and Widgeon Lakes. Total and average surface acreage of waters in the Pillar-Widgeon Lake Chain is 61.1 and 6.1, respectively. Upper and Lower Hampton Lakes are the largest waters between both chains at 68 and 20 surface acres, respectively. Draining the Hampton Lakes is a series of small waters including the Hampton Slough Complex (Hampton Slough, Hen Lake, Dabbler Lake, ~3 small unnamed ponds, and inlets/outlets) and Marie Lake at the end of the chain.

Upper and Lower Hampton Lakes and the Pillar-Widgeon Lake Chain are very popular trout fisheries. All of these waters are open seasonally from April 1st through September 30th. The Washington Department of Fish Wildlife (WDFW) annually stocks rainbow trout fingerlings (2-3 inches) during the spring at a rate of 200-300 fish per surface acre. By the following spring, trout measure 11-13 inches in length and make up the bulk of the catch by anglers. Past WDFW angler creel surveys indicate that 5,000-6,000 angler trips are spent at the Pillar-Widgeon Lake Chain and Hampton Lakes annually when trout fishing is excellent. Between 10-15% of those trips occur on opening day. The majority of angler trips are spent at the Hampton Lakes.

WDFW does not manage the Hampton Slough Complex or Marie Lake for trout. These waters are shallow, weedy, and not suitable for trout management. In certain years, these waters can offer fishing opportunities for warmwater fish species like bass and panfish.

ii. Justification:

Lakes managed as trout fisheries offer the greatest fishing opportunity when maintained as monocultures free from competing, predatory, and/or nuisance fish species (e.g., pumpkinseed sunfish, yellow perch, bullhead catfish, common carp, bass, etc.) that negatively impact their abundance and growth. WDFW keeps lakes free from competing, predatory, and/or nuisance fish species through periodic treatment using the aquatic pesticide rotenone. WDFW has treated lakes within the CNWR since the 1950s.

Angler success at the Pillar-Widgeon and Hampton Lake Chains was been poor over the past 5-6 years. Opening day angler creel survey results for the Hampton Lakes have averaged less than two trout harvested per angler. Target harvest rates for lakes like the Hamptons should be ≥3.0 trout per angler. Additionally, high abundances of pumpkinseed sunfish have been observed in both lake chains with the possibility of other nuisance fish species present as well. The presence of pumpkinseed sunfish impacts the survival of stocked rainbow trout fingerlings. Pumpkinseed sunfish directly complete with rainbow trout fingerlings for the same food resources (i.e., zooplankton and aquatic insects). Rehabilitating both lake chains will eradicate all nuisance fish species present and restore the trout fishery.

iii. Physical Description of Water(s) Proposed for Treatment:

a. Water Name: Pillar Lake
b. Location: T17N-R29E-S19
c. Size: 9.8 Surface Acres (SA)
d. Average Depth: 12.0 feet
e. Maximum Depth: 37.0 feet
f. Water Volume: 117.6 Acre Feet (AF)
g. Inlet Description: Subterranean flow influenced by groundwater/water table. Unknown and seasonally influenced quantity of water into Pillar Lake.
h. Outlet Description: Intermittent flow into Snipe Lake. Outlet approximately 30 yards in length and ≤1cfs of flow.
i. Public Access: Walk-in only. Access managed by CNWR staff.
j. Land Ownership: 100% federal government ownership (United States Fish and Wildlife Service-USFWS).
k. Established Resorts: None

a. Water Name: Snipe Lake
b. Location: T17N-R29E-S19
c. Size: 4.0 SA
d. Average Depth: No Data
e. Maximum Depth: 15.0 feet
f. Water Volume: 60.0 AF
g. Inlet Description: Intermittent flow from Pillar Lake. Inlet approximately 30 yards in length and ≤1 cfs of flow.
h. Outlet Description: Perennial flow into Cattail Lake. Outlet approximately 10 yards in length and ≤1 cfs of flow.
i. Public Access: Walk-in only. Access managed by CNWR staff.
j. Land Ownership: 100% federal government ownership (USFWS).
k. Established Resorts: None

a. Water Name: Cattail Lake
b. Location: T17N-R29E-S19
c. Size: 18.0 SA

d. Average Depth: No Data
e. Maximum Depth: 15.0 feet
f. Water Volume: 270.0 AF
g. Inlet Description: Perennial flow from Snipe Lake. Inlet approximately 10 yards in length and ≤1cfs of flow.
h. **Outlet Description:** Seepage into Poacher Lake through exiting dike. A culvert use to deliver surface flow into Poacher Lakes is now completely plugged and covered with sediment. As near as I can tell Pillar, Snipe, and Cattail Lakes are completely isolated from the rest of the Pillar-Widgeon Lake Chain.
i. Public Access: Walk-in only. Access managed by CNWR staff.
j. Land Ownership: 100% federal government ownership (USFWS).
k. Established Resorts: None

a. Water Name: Gadwall Lake
b. Location: T17N-R29E-S19
c. Size: 5.0 SA
d. Average Depth: 13.7 feet
e. Maximum Depth: 59.0feet
f. Water Volume: 68.5 AF
g. Inlet Description: Subterranean flow influenced by groundwater/water table. Unknown and seasonally influenced quantity of water into Gadwall Lake.
h. Outlet Description: Perennial flow into Poacher Lake. Outlet approximately 10 yards in length and ≤2 cfs of flow.
i. Public Access: Walk-in only. Access managed by CNWR staff.
j. Land Ownership: 100% federal government ownership (USFWS).
k. Established Resorts: None

a. Water Name: Poacher Lake
b. Location: T17N-R29E-S19
c. Size: 1.0 SA
d. Average Depth: No Data
e. Maximum Depth: 10.0 feet
f. Water Volume: 10.0 AF
g. Inlet Description: Perennial flow from Cattail and Gadwall Lakes. Inlets approximately 10 yards each and ≤2 cfs of flow each.
h. Outlet Description: Perennial flow into Shoveler Lake. Outlet approximately 10 yards in length and between ≤4 cfs of flow.
i. Public Access: Walk-in only. Access managed by CNWR staff.
j. Land Ownership: 100% federal government ownership (USFWS).
k. Established Resorts: None

a. Water Name: Lemna Lake
b. Location: T17N-R29E-S19
c. Size: 3.0 SA
d. Average Depth: No Data
e. Maximum Depth: 10.0 feet
f. Water Volume: 30.0 AF
g. Inlet Description: Subterranean flow influenced by groundwater/water table. Unknown and

seasonally influenced quantity of water into Lemna Lake.

h. **Outlet Description:** Intermittent flow into Shoveler Lake. Outlet approximately five yards in length and ≤1 cfs of flow.
i. **Public Access:** Walk-in only. Access managed by CNWR staff.
j. **Land Ownership:** 100% federal government ownership (USFWS).
k. **Established Resorts:** None

a. **Water Name:** Shoveler Lake
b. **Location:** T17N-R29E-S19
c. **Size:** 6.0 SA
d. **Average Depth:** 10.5 feet
e. **Maximum Depth:** 63.0 feet
f. **Water Volume:** 88.0 AF
g. **Inlet Description:** Intermittent flow from Lemna Lake. Inlet approximately five yards in length and ≤1cfs of flow.
h. **Outlet Description:** Mostly subterranean during the year, but some seasonal surface flow into Widgeon Lake. Outlet approximately five yards in length and ≤1 cfs of flow.
i. **Public Access:** Walk-in only. Access managed by CNWR staff.
j. **Land Ownership:** 100% federal government ownership (USFWS).
k. **Established Resorts:** None

a. **Water Name:** Sago Lake
b. **Location:** T17N-R29E-S19&30
c. **Size:** 1.5 SA
d. **Average Depth:** 14.3 feet
e. **Maximum Depth:** 35.0 feet
f. **Water Volume:** 21.5 AF
g. **Inlet Description:** Subterranean flow influenced by groundwater/water table. Unknown and seasonally influenced quantity into Sago Lake.
h. **Outlet Description:** Perennial flow into Hourglass Lake. Outlet approximately 20 yards in length and ≤2 cfs of flow.
i. **Public Access:** Walk-in only. Access managed by CNWR staff.
j. **Land Ownership:** 100% federal government ownership (USFWS).
k. **Established Resorts:** None

a. **Water Name:** Hourglass Lake
b. **Location:** T17N-R29E-S30
c. **Size:** 2.0 SA
d. **Average Depth:** 11.3 feet
e. **Maximum Depth:** 38.0 feet
f. **Water Volume:** 22.6 AF
g. **Inlet Description:** Perennial flow from Sago Lake. Inlet approximately 20 yards in length and ≤2 cfs of flow.
h. **Outlet Description:** Perennial flow into Widgeon Lake. Outlet approximately 20 yards in length and ≤2 cfs of flow.
i. **Public Access:** Walk-in only. Access managed by CNWR staff.
j. **Land Ownership:** 100% federal government ownership (USFWS).
k. **Established Resorts:** None

a. **Water Name:** Widgeon Lake
b. **Location:** T17N-R29E-S30
c. **Size:** 10.8 SA
d. **Average Depth:** 14.2 feet
e. **Maximum Depth:** 38 feet
f. **Water Volume:** 153.4 AF
g. **Inlet Description:** Perennial flow from Hourglass Lake and intermittent flow from Shoveler Lake. Perennial inlet approximately 20 yards in length and ≤2cfs of flow. Intermittent inlet approximately five yards in length and ≤1 cfs of flow.
h. **Outlet Description:** Perennial flow into Upper Hampton Lake. Outlet is approximately ¼ mile in length and ≤3 cfs of flow.
i. **Public Access:** Walk-in access only. Access managed by CNWR staff.
j. **Land Ownership:** 100% federal government ownership (USFWS).
k. **Established Resorts:** None

a. **Water Name:** Upper Hampton Lake
b. **Location:** T17N-R29E-S30
c. **Size:** 68.0 SA
d. **Average Depth:** 12.3 feet
e. **Maximum Depth:** 61.0 feet
f. **Water Volume:** 839.0 AF
g. **Inlet Description:** Perennial flow from Widgeon Lake and subterranean flow from Potholes Canal. Perennial inlet approximately ¼ mile in length and ≤3 cfs
h. **Outlet Description:** Perennial flow into Hen Lake and intermittent flow into Lower Hampton Lake. Perennial outlet approximately 200 yards in length and ≤5 cfs of flow. Intermittent outlet approximately 10 yards in length and ≤1 cfs of flow.
i. **Public Access:** Walk-in only. Access managed by CNWR staff.
j. **Land Ownership:** 100% federal government ownership (USFWS).
k. **Established Resorts:** None

a. **Water Name:** Lower Hampton Lake
b. **Location:** T17N-R29E-S30
c. **Surface Acres:** 20.0 SA
d. **Average Depth:** 23.6 feet
e. **Maximum Depth:** 46.0 feet
f. **Water Volume:** 472.0 AF
g. **Inlet Description:** Intermittent flow from Upper Hampton Lake. Intermittent outlet approximately 10 yards in length and ≤1 cfs of flow.
h. **Outlet Description:** Perennial flow into Hen Lake and seepage into the Hampton Slough Complex. The outlet from Lower Hampton Lake into Hen Lake cascades for approximate 10 yards at a "steep" gradient with ≤3 cfs of flow. This outlet is a potential upstream fish passage barrier. A culvert use to deliver surface flow between Lower Hampton Lake and the Hampton Slough Complex. However, this culvert is completely blocked and covered with sediment with the only water exchange between the two being seepage through the dike. As such, fish can no longer migrate from the Hampton Slough Complex into Lower Hampton Lake.

i. **Public Access:** Vehicle access at south end of lake. Access managed by CNWR staff.
j. **Land Ownership:** 100% federal government ownership (USFWS).
k. **Established Resorts:** None

a. **Water Name:** Hampton Slough Complex (Hampton Slough, Hen Lake, Dabbler Lake, approximately three small unnamed ponds, and interconnected inlets/outlets)
b. **Location:** T17N-R29E-S31
c. **Surface Acres:** Approximately 15.0 SA
d. **Average Depth:** Variable
e. **Maximum Depth:** Variable
f. **Water Volume:** Approximately 100.0 AF
g. **Inlet Description:** Two inlets into the Hampton Slough Complex from Lower Hampton Lake. The first inlet is seepage through the dike between Lower Hampton Lake and Hampton Slough. A culvert use to deliver surface flow between Lower Hampton Lake and the Hampton Slough. This culvert is completely blocked and covered with sediment. As such, fish can no longer migrate from the Hampton Slough into Lower Hampton Lake. The second inlet is flow from Lower Hampton Lake into Hen Lake.
h. **Outlet Description:** Two outlets with perennial flow (2-8 cfs) from the Hampton Slough Complex. The first inlet is flow (~2 cfs) from Hampton Slough and through two small (<1.0 SA) unnamed ponds into Marie Lake. The second inlet is flow (~8 cfs) from Hen Lake through a drop culver structure into a small unnamed pond, Dabbler Lake, and then Marie Lake.
i. **Public Access:** Walk-in only. Access managed by CNWR staff.
j. **Land Ownership:** 100% federal government ownership (USFWS).
k. **Established Resorts:** None

a. **Water Name:** Marie Lake
b. **Location:** T17N-R29E-S31
c. **Surface Acres (Estimated after ~6.0 feet lake drawdown):** 3.0 SA
d. **Average Depth:** No Data
e. **Maximum Depth:** 8.0 feet
f. **Water Volume:** 24.0 AF
g. **Inlet Description:** Two inlets with perennial flow (2-8 cfs) from the Hampton Slough Complex (see above).
h. **Outlet Description:** Normally, perennial flow (~11 cfs) into Para-Juvenile Lakes, however, with lake drawdown there would be none until detoxification and refill.
i. **Public Access:** Walk-in only. Access managed by CNWR staff.
j. **Land Ownership:** 100% federal government ownership (USFWS).
k. **Established Resorts:** None

iv. Proposed Fish Management Action(s):

a. **Water Name:** Pillar Lake
b. **Target Species:** Pumpkinseed sunfish
c. **Date Last Rehabilitated:** 2004
d. **Proposed Treatment Date:** October 7-28, 2013
e. **Replanting Date:** March-June 2014
f. **Species:** Rainbow Trout

g. **Size(s):** ≤100 fish/pound (fpp)
h. **Proposed Replanting Rate:** 200 fish/surface acre (SA)
i. **Proposed Toxicant:** CFT Legumine liquid rotenone
j. **Amount of Rotenone (5% Active Ingredient):** ≤135.8 gallons
k. **Method of Application:** Aerial spray (Helicopter)

a. **Water Name:** Snipe Lake
b. **Target Species:** Pumpkinseed sunfish
c. **Date Last Rehabilitated:** 2004
d. **Proposed Treatment Date:** October 7-28, 2013
e. **Replanting Date:** March-June 2014
f. **Species:** Rainbow Trout
g. **Size(s):** ≤100 fpp
h. **Proposed Replanting Rate:** 200 fish/SA
i. **Proposed Toxicant:** CFT Legumine liquid rotenone
j. **Amount of Rotenone (5% Active Ingredient):** ≤69.3 gallons
k. **Method of Application:** Aerial spray (Helicopter)

a. **Water Name:** Cattail Lake
b. **Target Species:** Pumpkinseed sunfish
c. **Date Last Rehabilitated:** 2004
d. **Proposed Treatment Date:** October 7-28, 2013
e. **Replanting Date:** March-June 2014
f. **Species:** Rainbow Trout
g. **Size(s):** ≤100 fpp
h. **Proposed Replanting Rate:** 200 fish/SA
i. **Proposed Toxicant:** CFT Legumine liquid rotenone
j. **Amount of Rotenone (5% Active Ingredient):** ≤311.9 gallons
k. **Method of Application:** Aerial spray (Helicopter)

a. **Water Name:** Gadwall Lak**e**
b. **Target Species:** Pumpkinseed sunfish
c. **Date Last Rehabilitated:** 2004
d. **Proposed Treatment Date:** October 7-28, 2013
e. **Replanting Date:** March-June 2014
f. **Species:** Rainbow Trout
g. **Size(s):** ≤100 fpp
h. **Proposed Replanting Rate:** 200 fish/SA
i. **Proposed Toxicant:** CFT Legumine liquid rotenone
j. **Amount of Rotenone (5% Active Ingredient):** ≤79.1 gallons
k. **Method of Application:** Aerial spray (Helicopter)

a. **Water Name:** Poacher Lake
b. **Target Species:** Pumpkinseed sunfish
c. **Date Last Rehabilitated:** 2004
d. **Proposed Treatment Date:** October 7-28, 2013
e. **Replanting Date**: March-June 2014

f. Species: Rainbow Trout
g. Size(s): ≤100 fpp
h. Proposed Replanting Rate: 200 fish/SA
i. Proposed Toxicant: CFT Legumine liquid rotenone
j. Amount of Rotenone (5% Active Ingredient): ≤11.6 gallons
k. Method of Application: Aerial spray (Helicopter)

a. Water Name: Lemna Lake
b. Target Species: Pumpkinseed sunfish
c. Date Last Rehabilitated: 2004
d. Proposed Treatment Date: October 7-28, 2013
e. Replanting Date: March-June 2014
f. Species: Rainbow Trout
g. Size(s): ≤100 fpp
h. Proposed Planting Rate: 200 fish/SA
i. Proposed Toxicant: CFT Legumine liquid rotenone**:**
j. Amount of Rotenone (5% Active Ingredient): ≤34.7 gallons
k. Method of Application: Aerial spray (Helicopter)

a. Water Name: Shoveler Lake
b. Target Species: Pumpkinseed sunfish
c. Date Last Rehabilitated: 2004
d. Proposed Treatment Date: October 7-28, 2013
e. Replanting Date: March-June 2014
f. Species: Rainbow Trout
g. Size(s): ≤100 fpp
h. Proposed Replanting Rate: 200 fish/SA
i. Proposed Toxicant: CFT Legumine liquid rotenone
j. Amount of Rotenone (5% Active Ingredient): ≤101.6 gallons
k. Method of Application: Aerial spray (Helicopter)

a. Water Name: Sago Lake
b. Target Species: Pumpkinseed sunfish
c. Date Last Rehabilitated: 2004
d. Proposed Treatment Date: October 7-28, 2013
e. Replanting Date: March-June 2014
f. Species: Rainbow Trout
g. Size(s): ≤100 fpp
h. Proposed Planting Rate: 200 fish/SA
i. Proposed Toxicant: CFT Legumine liquid rotenone
j. Amount of Rotenone (5% Active Ingredient): ≤24.8 gallons
k. Method of Application: Aerial spray (Helicopter)

a. Water Name: Hourglass Lake
b. Target Species: Pumpkinseed sunfish
c. Date Last Rehabilitated: 2004
d. Proposed Treatment Date: October 7-28, 2013

e. **Replanting Date:** March-June 2014
f. **Species:** Rainbow Trout
g. **Size(s):** ≤100 fpp
h. **Proposed Planting Rate:** 200 fish/SA
i. **Proposed Toxicant:** CFT Legumine liquid rotenone
j. **Amount of Rotenone (5% Active Ingredient):** ≤26.1 gallons
k. **Method of Application:** Aerial spray (Helicopter)

a. **Water Name:** Widgeon Lake
b. **Target Species:** Pumpkinseed sunfish
c. **Date Last Rehabilitated:** 2004
d. **Proposed Treatment Date:** October 7-28, 2013
e. **Replanting Date:** March-June 2014
f. **Species:** Rainbow Trout
g. **Size(s):** ≤100 fpp
h. **Proposed Planting Rate:** 200 fish/SA
i. **Proposed Toxicant:** CFT Legumine liquid rotenone
j. **Amount of Rotenone (5% Active Ingredient):** ≤177.2 gallons
k. **Method of Application:** Aerial spray (Helicopter)

a. **Water Name:** Upper Hampton Lake
b. **Target Species:** Pumpkinseed sunfish
c. **Date Last Rehabilitated:** 2004
d. **Proposed Treatment Date:** October 7-28, 2013
e. **Replanting Date:** March-June 2014
f. **Species:** Rainbow Trout
g. **Size(s):** ≤100 fpp
h. **Proposed Planting Rate:** 300 fish/SA
i. **Proposed Toxicant:** Cube Root powdered and CFT Legumine liquid rotenone
j. **Amount of Rotenone (5% Active Ingredient):** ≤7,987.3 pounds of powder and ≤40 gallons of liquid
k. **Method of Application:** Slurry (powdered) and spray (liquid)

a. **Water Name:** Lower Hampton Lake
b. **Target Species:** Pumpkinseed sunfish
c. **Date Last Rehabilitated:** 2004
d. **Proposed Treatment Date:** October 7-28, 2013
e. **Replanting Date:** March-June 2014
f. **Species:** Rainbow Trout
g. **Size(s):** ≤100 fpp
h. **Proposed Replanting Rate:** 300 fish/SA
i. **Proposed Toxicant:** Cube Root powdered and CFT Legumine liquid rotenone
j. **Amount of Rotenone (5% Active Ingredient):** ≤4,493.4 pounds of powder and ≤40 gallons of liquid
k. **Method of Application:** Slurry (powdered) and spray (liquid)

a. **Water Name:** Hampton Slough Complex (Hampton Slough, Hen Lake, Dabbler Lake,

approximately three small unnamed ponds, and interconnected inlets/outlets)

b. **Target Species:** Pumpkinseed sunfish
c. **Date Last Rehabilitated:** 2004
d. **Proposed Treatment Date:** October 7-28, 2013
e. **Replanting Date:** N/A
f. **Species:** N/A
g. **Size(s):** N/A
h. **Proposed Replanting Rate:** N/A
i. **Proposed Toxicant:** Cube Root powdered and CFT Legumine liquid rotenone
j. **Amount of Rotenone (5% Active Ingredient):** ≤952 pounds of powder and ≤30 gallons of liquid
k. **Method of Application:** Slurry (powdered) and spray (liquid)

a. **Water Name:** Marie Lake
b. **Target Species:** Pumpkinseed sunfish
c. **Date Last Rehabilitated:** 2004
d. **Proposed Treatment Date:** October 7-28, 2013
e. **Replanting Date:** N/A
f. **Species:** N/A
g. **Sizes:** N/A
h. **Proposed Replanting Rate:** N/A
i. **Proposed Toxicant**: Cube Root powdered and CFT Legumine liquid rotenone
j. **Amount of Rotenone (5% Active Ingredient):** None (receiving and detoxification basin)
k. **Method of Application:** Direct drainage

v. Proposed Maximum Concentration and Total Amount of Toxicant Used:

a. **Pillar-Widgeon Lake Chain:** ≤972.0 gallons of liquid rotenone; total treatment concentration of ≤3.5ppm
b. **U/L Hampton Lakes:** ≤12,480.7 pounds and ≤40 gallons of powdered and liquid rotenone, respectively; total treatment concentration of ≤4.0ppm
c. **Hampton Slough Complex:** ≤952.0 pounds and ≤30 gallons of powdered and liquid rotenone, respectively; total treatment concentration of ≤4.0ppm
d. **Marie Lake:** N/A (Receiving and detoxification basin); total treatment concentration of ≤4.0ppm

vi. Crew Description:

A work crew of approximately 12-15 staff will be required in order to complete the Pillar-Widgeon and Hampton Lake Chain Rehabilitations within one week. Specifically, the District 5 Fish Biologist (Chad Jackson) will act as the project lead overseeing all aspects of the treatment. Chad Jackson possesses a valid Washington pesticide application license. Other members of the WDFW staff possess valid pesticide application licenses and will assist the project lead with certain aspects of the treatment.

II. INTENDED OUTCOME AND MEASURE(S) OF SUCCESS

The intended outcome of the rehabilitation is to completely eradicate nuisance fish species present and restore the quality rainbow trout fisheries in the waters identified above. Treatment success will be measured primarily through angler success during opening day creel surveys. Trout harvest rates should be ≥3.0 fish per angler on opening day. Additionally, periodic fish community surveys using electrofishing and gillnetting will be used to determine the percent kill of nuisance fish species and/or their reestablishment in any of the waters identified above.

III. NATURAL RESOURCE IMPACTS

Impacts to natural resources in both lake chains include the eradication of targeted nuisance fish species and any remaining rainbow trout. There are no native or endemic fish species concerns for these waters because most of them were artificially created through irrigation seepage and thus originally fishless. Varying levels of mortality will be suffered by other aquatic biota including phytoplankton, zooplankton, and benthos (e.g., insects, crayfish, snails, clams, etc.). However, according to the literature these species recover to at least pre-treatment levels and in several cases recovery exceeds pre-treatment levels. Recover of these species is so immediate because a 100% kill is never achieved, abundances of some species (e.g., phytoplankton and zooplankton) is normally low during the fall, the eggs of some species are already deposited in the sediment and are not affected by rotenone, and/or they reside in the sediment that naturally detoxifies rotenone. Additionally, amphibians that metamorphose during the fall and/or species that overwinter with gills could be impacted during treatment. The most common amphibian species within the CNWR and surrounding area impacted by lake rehabilitations is the non-native bullfrog.

IV. RECREATIONAL IMPACTS

Recreational fishing in the Pillar-Widgeon Lake Chain and Hampton Lakes will be severely impacted because there will be no larger size rainbow trout present for anglers to catch in 2014. Normally, WDFW stocks rehabilitated lakes with catchable-size (11-13 inches) rainbow trout the following spring to ensure there is no interruption in angling opportunity. As mentioned above, all of these waters proposed for rehabilitation are located within a national wildlife refuge. USFWS national wildlife refuge policy states that catchable-size sport fish cannot be stocked into refuge waters for the sole purpose of maintaining recreational fisheries. As such, fishing in 2014 will be postponed to allow rainbow trout fingerlings time to grow to catchable size. Recreational fishing will resume in 2015.

V. ECONOMIC IMPACTS

Potential economic impacts to local economies are possible when the Pillar-Widgeon Lake Chain and Hampton Lakes are unfishable in 2014 (see Section IV above). The degree of impact to local economies is unknown. However, from 2015 and throughout the life (6-10 years) of the rehabilitation, the Pillar-Widgeon Lake Chain and Hampton Lakes should provide excellent fishing for trout. This increase in fishing quality should increase angler participation that in turn provides a boost to local economies.

VI. MITIGATION FOR ADVERSE IMPACTS

Since catchable rainbow trout cannot be stocked into CNWR lakes, the only mitigation WDFW will engage in is to alert recreational anglers that the lakes within the Pillar-Widgeon and Hampton Chains will not be fishable in 2014. Through various media outlets, WDFW will alert anglers that the Pillar-Widgeon Lake Chains will not be fishable in 2014.

VII. OTHER RELATED FISH MANAGEMENT ACTION(S)

At this time no other fish management related action(s) will be undertaken by WDFW.

VIII. PUBLIC NOTIFICATION

WDFW will hold public meetings at the Region 2 Office in Ephrata and at the Natural Resources Building in Olympia. The purpose of these meetings is to alert the general public of the proposed treatments, collect public comments, and assess public opinion of the proposed project. Notice of the public meeting will be made through a WDFW press release and ads in pertinent local newspapers.

Additionally, all adjacent landowners within ¼ mile of the project will receive two notification letters about the proposed treatments. During treatment and until the lakes detoxify, WDFW will sign all points of access alerting the public about the treatment.

In early 2014, WDFW will alert recreational anglers through various media outlets that the Pillar-Widgeon and Hampton Lake Chains will be unfishable.